

## IMPRESSOR ASSEMBLY FOR ADHERING A SANITARY MEMBER TO A CAN LID AND METHOD OF IMPRESSING

### **CROSS REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims priority to U.S. Provisional Patent Application No. 60/456,676, filed March 24, 2003, entitled TAMPING DEVICE FOR CAN TOP COVERS.

### **BACKGROUND OF THE INVENTION**

#### **Field of Invention**

[0002] This invention is directed to a method and apparatus for applying a protective member to the top of a can and, more particularly, for applying a sanitary cover to the top of a can in a manner which substantially eliminates wrinkling of the member while providing a sanitary layer.

#### **Background**

[0003] It is well known in the art that food and beverages are served in cans. During transport and storage, the can lids may become dirty and unsanitary. However, the cans are designed to come directly in contact to the mouth when used, or in the situation in which the entire lid is removed such as with canned food, the can lid may often come in contact with the food contaminating the contents therein.

[0004] It is known in the art to provide a protective member across the can lid to maintain the integrity of the can lid surface. It is also known to provide indicia on the member.

[0005] Furthermore, these cans, as a result of the packaging process, have a bowed type construction and an opening device affixed to the top of the can. This opening device may take the form of either a small peel strip in which a ring is pulled to remove a portion of the top with the ring to provide an aperture at the top of the can or an easy open top, popularly known as the "pop top" in which a tab affixed to the can, acting as a lever, deflects a perforated portion of the can into the can to provide an opening.

[0006] Furthermore, it is known from soup cans and the like to remove the entire lid of the can either by an oversized peel strip in which the entire lid is peeled away or by utilizing a can opener. In any event, the opening device provides a non-uniform surface so that any barrier applied directly to the surface must accommodate the non-uniformities to provide a substantially wrinkle-free uniform barrier to the can surface to prevent any opening in the barrier for dirt, moisture or oxygen to enter.

[0007] However, without a proper method for applying the protective member, each member must be applied by hand which is time consuming. Even if applied by hand, the uniform member is often not uniformly applied and is often wrinkled. The discontinuities in the can lid also contribute to wrinkling no matter how the member is applied. The wrinkles provide room for air bubbles and moisture to be trapped at the can and attack the can surface. Wrinkles or discontinuities at the edges allow dirt to enter underneath the member to ruin the integrity of the can surface. Furthermore, wrinkling of the membrane ruins the aesthetic qualities of any printed material on the membrane, or makes the indicia illegible.

[0008] Therefore, a method and apparatus for applying the member to the non-uniform curved surface of the can to provide a smooth member to the can is needed.

### **SUMMARY OF THE INVENTION**

[0009] An apparatus for adhering a sanitary member to a can lid includes an impressor head for impressing and affixing a sanitary member to the top surface of a can. The impressor head has a base. A tooth descends from the impressor head and is shaped and sized to be received in fitting relationship with a recess of a can lid.

[0010] In a preferred embodiment, the tooth defines an interior space. A compressible pad is disposed within the interior space for coming in contact and compressing against the can lid when the tooth is in a fitting relationship with the countersink recess of a can lid. The pad may be formed in a doughnut shape to accommodate the apex of a can and the structure contained thereon. An air vent is provided through the impressor head to allow air to escape during the impressing process.

[0011] During impressing, a member having a diameter greater than the diameter of the rim of a can is disposed tautly and flatly across at least a portion of the rim of the can. The impressor head is moved towards the can lid through the member so that the tooth is received in a fitting relationship with the countersink recess of the can lid with the film disposed between the recess and the tooth. The impressor head is then removed from this fitting relationship with the countersink recess. In a preferred embodiment, the member is a flexible plastic biodegradable barrier having an adhesive thereon, which is disposed on the can to overhang the rim of the can prior to impressing.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0012] For a full understanding of the invention, reference is had to the following description taken in connection with the accompanying drawings in which:

[0013] Fig. 1 is an exploded perspective view of the impressor assembly prior to impressing in accordance with the invention;

[0014] Fig. 2 is a sectional view of the impressor assembly prior to impressing constructed in accordance with the invention;

[0015] Fig. 3 is a top plan view of the impressor pad assembly showing the can in phantom with the impressor pad assembly constructed in accordance with the invention; and

[0016] Fig. 4 is a partial sectional view of the impressor pad assembly impressing the member onto a can in accordance with the present invention.

### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

[0017] Reference is first made to Figs. 1 and 2. An impressor assembly, generally indicated as 10, includes an impressor head, generally indicated as 12. Impressor head 12 includes a base 14. Base 14 has a diameter  $D'$ . Substantially at the diameter of base 14, a tooth 16 descends from base 14 forming an interior area 18.

[0018] In a preferred embodiment, impressor assembly 10 is used in a high output labeling device (not shown). Assembly 10 is affixed to a mandrel of the device as known in the

art. In a further preferred, but not limiting, embodiment, diameter D' is matched to the diameter of the mandrel.

[0019] As is known in the art, a can 200 includes a cylindrical wall 202. A lid generally indicated as 204 is disposed on cylindrical wall 202 at a rim 213 elevated above a surface 206 of lid 204. Lid 204 also includes an interior side wall 212. As is known in conventional cans, such as pop-top cans; surface 206 includes a perforated portion 208. A tab 210, acting as a lever, known in the art as "easy open top", is affixed at least partially overlapping the perforated area so that lifting of the tab 210 causes the perforated area 208 to be separated from surface 206 to create an opening in surface 206. In many cans, surface 206 is convex as a result of a can's internal pressure or the attaching of lid 204 and a portion of tab 210 is disposed at an apex of surface 206.

[0020] Wall 202 meets lid 204 to form rim 213 at the top of a side wall 212 and a recess/countersink 214. Countersink 214 circumscribes top surface 206 and has a diameter D.

[0021] Tooth 16 is sized and shaped to be received by countersink 214 in a fitting relationship, i.e., tight, "hand-in-glove" fit. In a preferred embodiment, tooth 16 has a narrow knife edge-like profile with diameter D substantially equal to the diameter D of countersink 214. It should be noted, that tooth 16 may have any shape, as will be discussed below, that is received in a fitting relationship within countersink 214 and may have any diameter which is just less than the diameter of interior wall 212.

[0022] Impressor head 14 includes an air vent 20.

[0023] It should be noted, that in a preferred embodiment imprinter head 12 is affixed to an apparatus for applying pressure to head assembly to force head 12 towards can 200. This is preferably a high speed automated labeling device. A mounting recess 22 extending through imprinter head 12 is provided for affixing imprinter assembly 10 in a quick change out manner to a labeling device (mandrel) for impressing imprinter head 12 towards the can to facilitate a rapid change out when the imprinter apparatus wears out or to facilitate processing of different sized cans. A screw head fits within the taper of mounting recess 22 in a flush manner and affixes base 14 to the labeling device.

[0024] In a preferred embodiment, impressor assembly 10 includes a compressor pad 30 disposed in interior area 18 and is affixed to base 14 by a light adhesive sufficient to maintain compressor pad 30 to base 14 while allowing easy removal when pad 30 wears out. Compressor pad 30, by way of example, is made from foam rubber, but may be made of any resilient, compressible material such as neoprene, polyolefin, poron, or the like. Compressor pad 30 has a thickness in its uncompressed condition which is less than the distance from a tip of tooth 16 to base 14 (height) so that tooth 16 extends beyond pad 30 in the uncompressed condition.

[0025] In this way, tooth 16 is the first structure of impressor pad assembly 10 to contact the member to be impressed on can lid 204. In a preferred embodiment, pad 30 is 2 mm thinner than the distance that tip 24 of tooth 16 extends from base 14. In a preferred embodiment, pad 30 has a doughnut shape, i.e. is formed with an opening 32 substantially at its center. Although, as will be discussed below, pad 30 acts to press and smooth the barrier against can lid surface 206, it is not required for operation of the invention. Furthermore, in a preferred embodiment, opening 32 is substantially centered about the apex of surface 206 of can 200 in order to receive, but not press against, the non-uniform tab structure of can 200. However, for certain pad materials to accommodate lever 210, no opening is required.

[0026] During operation, a member 50 is disposed on rim 213 of can 200. Member 50 is a protective member formed of a flexible film or other suitable material such as plastic, which is pressed on to rim 213 of a recessed top of a food or beverage container or can 200. The surface 52 of member 50 is coated with an adhesive 51 (Fig. 4). The adhesive secures member 50 to rim 213 with sufficient strength to hold member 50 in place, but release member 50 under the pressure applied to member 50 by impressor assembly 10. Additionally, member 50, by being momentarily held in place along the surface of rim 213, while being pushed down by tooth 16, creates a tension in a member 50. The tension and taught and flat surface of member 50 as it descends results in a relatively skin tight, wrinkle-free placement of member 50 onto surface 206. The adhesive then affixes member 50 in a relatively skin tight confirmation to can lid 204.

[0027] In a preferred embodiment, pad 30 compresses against member 50 to press the underlying adhesive further against surface 206, and by placing a uniform pressure centered about the apex onto member 50, maximizing contact with surface 206 without inducing wrinkles;

resulting in a substantially skintight wrinkle-free attachment of member 50 onto surface 206 and wall 212.

[0028] In a preferred embodiment, member 50 is biodegradable and the adhesive may be impregnated with an antibacterial and/or aroma-releasing agent. A diameter  $D''$  of barrier 50 is sufficiently greater than the diameter of rim 213 to provide an overhang 52 (Fig. 3) entirely around rim 213 even if member 50 is provided slightly off center relative to rim 213. In a preferred embodiment, the diameter  $D''$  of member 50 is 2 mm to 4 mm greater than the diameter  $D''$  of rim 213.

[0029] Impressor assembly 10 is then moved in the direction of arrow A. Because the diameter of tooth 16 is less than diameter  $D''$  of wall 212, tooth 16 catches member 50 within rim 213 as impressor assembly 10 moves in the direction of arrow A. As a result, tooth 16 pushes member 50 towards can surface 206 and against wall 212.

[0030] Tooth 16 is received in fitting relationship by countersink 214. In other words, the shape and size of tooth 16 is the mirror image of countersink 214 so as to fit tooth 16 (Fig. 4) with member 50 pressed between countersink 214 and tooth 16. Furthermore, wall diameter  $D''$  is not significantly greater than tooth diameter  $D$  (no more than the thickness of member 50), so that as impressor assembly 10 moves in the direction of arrow A, tooth 16 presses member 50 against an interior wall 212 of rim 213 pressing member 50 between tooth 16, wall 212, countersink 214 and tip 24, substantially eliminating wrinkles. This action also forces member 50 against can surface 206 where it is adhered to surface 206 by adhesive 51.

[0031] In a preferred embodiment, compressor pad 30 also pushes down against member 50 to adhere member 50 to can lid 204. Compressor pad 30 also applies a uniform force centered around the center of can surface 206 to smooth out air bubbles which may have been trapped by member 50 and provide an even force across member 50. In this way, member 50 is flattened against interior rim wall 212 and into countersink 214 by tooth 16 and against surface 206 by compressor pad 30 to provide substantially skin-tight wrinkle-free impression of member 50 onto can lid 204. It is the overhang portion 52, which provides the sanitary seal along rim wall 212 preventing dirt from entering under the sanitary seal formed by member 50.

[0032] Impressor assembly 10 is then removed in the direction of arrow B while member 50 remains in place affixed by the adhesive bond between surface 206 and rim wall 212 and member 50.

[0033] By utilizing the compressor pad, air bubbles, which may trap moisture or provide an opening for dirt, are smoothed out during the impression process. Furthermore, by providing opening 32 to accommodate the apex and non-uniform structure of the pop top, the compressor pad 30 substantially smoothes member 50 about the incongruities of the can top surface by applying a uniform force during the impressor process. By providing air vent 20, any air, which may impede the impression process, is allowed to escape.

[0034] It should be noted, that the above invention was described as the preferred embodiment of the invention and is for use within an apexed can lid having a recess and a rim, utilizing an impressor head having a compression pad 30 therein. However, if the can contained no recess, the apparatus would still function as the teeth, having a slightly smaller diameter than the rim, would press member 50 against a flat surface 206 while still pressing overhang 52 of member 50 against rim wall 212.

[0035] Accordingly, by providing an impressor assembly having a compressor pad for impressing a sanitary film, a structure for squeezing out air to avoid the formation of air bubbles and moisture between the protective member on top of the can is provided. Furthermore, by providing the compression pad in the impressor head, an impressing device that causes excellent adhesion between the protective member and the top of the can to preclude contamination of the top of the can by any type of air or water borne bacteria or any other contaminant is provided. By making the pad 30 a compressible contact object, the impression head provides the proper pressure to the protective member at the top of the can, as a compressible member, is self-adjusting and therefore causes thorough adherence of the protective member to the can.

[0036] Furthermore, by providing the recessed opening 22, a screw may be accommodated in a flush manner to allow quick change to high speed labeling equipment facilitating the efficiencies of applying the protective member without coming in contact with the sanitary member during operation.

[0037] Thus, while there have been shown and described and pointed out novel features of the present invention as applied to preferred embodiments thereof, it will be understood that various omissions and substations and changes in the form and details of the disclosed invention may be made by those skilled in the art without departing from the spirit and scope of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

[0038] It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention, which as a matter of language might be said to fall there between.